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Established 1850 — Pioneer of the Gas Industry

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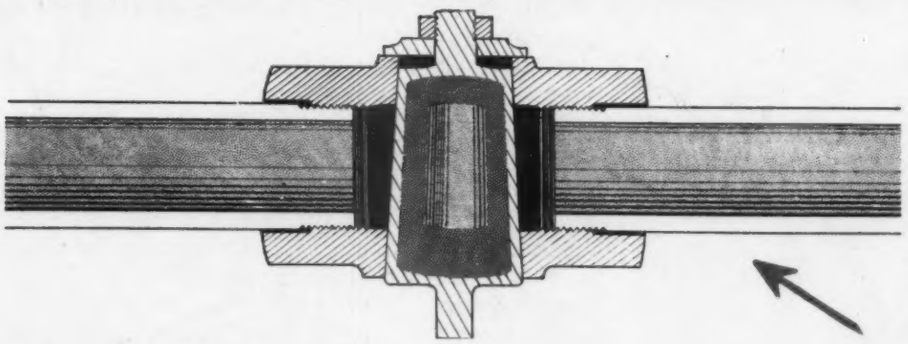

# This Recess Protects the Line

LATTIMER-STEVENS Recessed Stop Cocks are a positive protection to lines in which they are used. They provide added strength to the line at its weakest point where the thread begins.

These stop cocks are made with a deep recess on both ends. Carefully reamed out to fit the pipe, this recess forms a close-fitting sleeve, which avoids breakage of the pipe where cutting the thread has weakened it.

The stop cock itself is made of a high quality grey iron body with red brass key ground in. Each stop cock before it leaves the factory is tested both open and closed by heavy air pressure under water.

*Lattimer - Stevens Recessed Stop Cocks are made in flat-head style, galvanized, in 1¼", 1½" and 2" sizes.*

*Stop Cocks without recess also furnished in sizes from ¾" to 2".*

**THE LATTIMER-STEVENS COMPANY**
**72 Yale Avenue, Columbus, Ohio**

New England Representative
The Eastern Service Co.,
Boston, Mass.

New York Representative
Mulcare Engineering Co.,
100 Park Place,
New York

Pacific Coast Representative
A. P. Bartley,
San Francisco, Calif.

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# LattimerStevens
METER CONNECTIONS-SHELVES
STOP COCKS — AND SEALS

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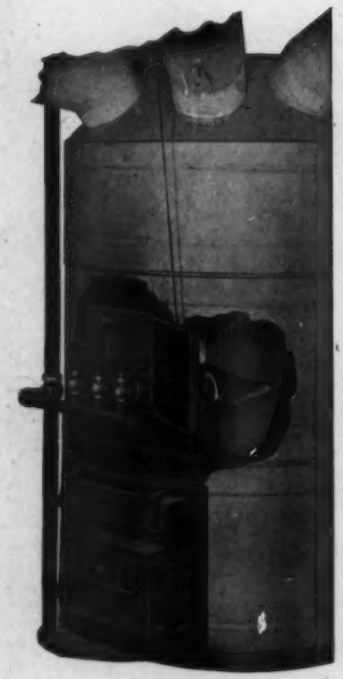
# *Easily Introduce House-Heating By Gas*

## *Use The Franklin Quick Removable Gas Burner System!*

## What Is The Franklin?



**The Franklin Quick Removable Gas Burner System, as illustrated, is an auxiliary heating appliance for use on coal furnaces and boilers.**

**It can be easily attached in a few minutes' time. Equipped with a swinging stop cock which makes a leak-proof installation when the burners are in use, and a complete shut-off when the burners are swung out of the way.**

**Venturi Tubes are used in the burners. Economy and perfect combustion are possible under any and all conditions without air mixer regulation. Varying gas pressures will not affect the burner, cause it to backfire in the mixer, or go out under low pressure.**

Wherever the Franklin Quick Removable Gas Burner System has been installed, the opening wedge for house-heating with gas has been driven.

Although The Franklin is but an auxiliary appliance to the coal furnace, it proves conclusively to the householder the utility, convenience and economy of gas.

The Franklin itself is convenient and economical. Once installed, it can be put in or taken out of use in one minute without the aid of tools. Thus, when it is inadvisable for coal to be used, the Franklin is put in service. When coal heating is desired, it is swung out of the way of the furnace door and the coal furnace is ready for use.

The Franklin Quick Removable Gas Burner System comes in all sizes for hot air furnaces, and steam and hot water boilers. It is extremely remarkable and, together with its low cost, it finds a ready reception.

## *What Users Say*

O. PRESCOTT BENNETT, M.D.
Washington, Illinois

December 8th, 1924.

Franklin Gas Burner Mfg. Co.
Cincinnati, Ohio.
Gentlemen:

I have used your No. 3 System Gas Burner for three years and have found it entirely satisfactory. It is all that you claim for it and more. I consider it by far the most convenient, most economical and most reliable gas burner on the market. I know of no way in which I could suggest an improvement upon it.

Yours very truly,
(Signed) O. P. BENNETT.

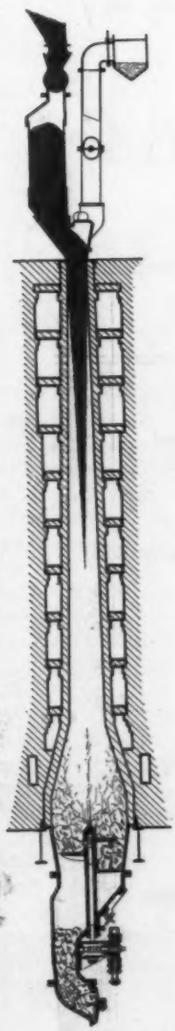
## Franklin Gas Burner Mfg. Co.

**CINCINNATI, OHIO**

Send for complete information on the Franklin Quick Removable Gas Burner System

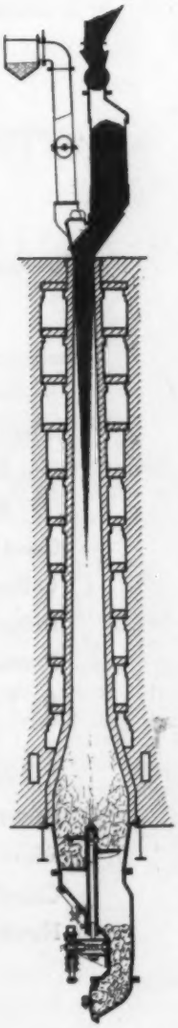
# GLOVER-WEST
# *Vertical Retorts*

## American Installations



**Fitchburg, Mass.**
**Springfield, Mass.**
**Pawtucket, R. I.**
**Portland, Me.**
**Ottawa, Ont.**
**Montreal, Que.**
**Fitchburg, Mass.** (Repeat)
**Pernambuco, Brazil**
**Santos, Brazil**
**Montreal, Que.** (Repeat)
**Vancouver, B. C.**
**Victoria, B. C.**
**Montreal, Que.** (2nd Repeat)
**Watertown, N. Y.**
**Malden, Mass.**
**Vancouver, B. C.** (Repeat)
**Toronto, Ont.**
**Portland, Me.** (Repeat)
**Buenos Aires**
**Santiago, Chile**
**Fargo, N. Dakota**

*Combined Daily Capacity*
*36,000,000 Cu. Ft.*



## WEST GAS IMPROVEMENT CO.
*of America, Inc.*
441 Lexington Ave., New York.

# American Gas Journal

*SIXTY-SIXTH YEAR*

*Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.*

S. G. KRAKE, Pres. & Treas. C. S. MYERS, Vice-Pres. A. M. GLEASON, Sec'y.

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*"MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS"*


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GAS JOURNAL

Vol. 122. No. 23 NEW YORK, JUNE 6, 1925 Whole No. 3523

# The Fuel of the Future

## XXII. Heat treatment of metals—Hardening of crank shafts

*Ismar Ginsberg*

THE Fuel of the Future Series, which is now concerned with the heat treatment of metals and the discussion of special cases of the application of gaseous fuel to these operations, has been giving considerable attention to the underlying principles that should and must govern industrial sales of gas if success is to be attained by the gas company in this field. A certain amount of time must be spent in preliminary work, in making surveys, in studying the intricate details of the manufacturing process before the use of gas as a fuel can be spoken of. It has been mentioned several times that requisite preparation or the lack of it can make or break any sale of gas for industrial purposes.

It is therefore interesting to study in the following a proposal that was presented to a manufacturing concern that was engaged in the manufacture of crank shafts. The object of this study is to indicate to the industrial gas man what may be considered as a very good example of the manner in which the preliminary study must be made in order that a comprehensive and intelligent report can be presented to the plant manager who is to be sold on gas.

The problem was the treatment of 100 cams per hour in a heat treating furnace.

### Reasons for Proposal

The report that was made in this particular case starts with a statement of the reasons why it is advocated that a change be made in the present method of hardening the cams. It is pointed out right in the first sentence that what is intended is not the sale of a gas-fired furnace and the addition of new equipment to the plant, but merely a proposal involving a change in the manufacturing process that will pay for itself in savings in labor, space and depreciation. The cornerstone of the entire industrial gas structure is succinctly defined in these few words. The gas salesman who approaches a prospective manufacturer must endeavor to sell him not so much an apparatus or a fuel as a definite service. It may be hard to convince the hard-headed plant manager that this can be done, but it is essential that gas be sold for industrial purposes on this basis. It should be pointed out to the manufacturer very emphatically that not only is a new fuel being sold him, but a service as well which will enable him to effect economics in his manufacturing process which will more than pay for the cost of the new apparatus and the increased expense involved in using gaseous fuel in place of cheaper ones. Of course, there may be cases where this is impossible, where the local conditions are such that there can be no improvement made in the thermal process, but these will be few and far between, and, as a general rule, it will be found that some simple change can be made which will react in favor of the gaseous fuel.

### Use of Automatic Apparatus

The manufacturer was then told that what was intended was the installation of an automatic machine which would tend to remove a difficulty that has existed in his plant and others of similar character. This difficulty has simply been that while most other operating details have been worked out scientifically and with due consideration of the advantages of automatic control and uniformity of production, the thermal end of the process has as a general rule been left untouched. Each and every plant possesses one or more places in the manufacturing process where the production slows up and if the plant uses heat for heat treatment or otherwise, it

may be stated that most always the neck in the bottle will be found in the heating operation.

Here again we see the plant manager approached along a line which is bound to win attention from him. All plant superintendents have the same trouble with production and they are usually very eager listeners to any feasible project which will tend to alleviate production difficulties. The fact that gas will operate in an automatically controlled furnace is attractive to them. The gas engineer thus puts himself in the position not only of furnishing a new and more efficient fuel, but also of improving the mechanical side of the process, so that it becomes continuous in character and therefore of similar nature as other processes in the plant. He brings to the harassed plant superintendent a practical solution of the production problem and if he succeeds actually in doing what he claims there is no further difficulty in selling gas as an industrial fuel in that plant.

*Heat Temperature Relations of Metals—Curve No. 1*

Thus the fundamental arguments presented to the factory manager in this case, and these arguments can be applied as a rule to most any case in question, are that the use of gas in the process is going to introduce economies in the manufacturing methods by removing the impediments to continuous operation in the plant and by saving labor and materials in the handling of the products during their sojourn in the heat treating department.

### Nature of the Savings

The next step was to outline a little more in detail the character of the savings that were to be made in the plant with the use of gas as fuel. The first saving was in space. Space always costs money and as a general rule a large amount of space is given over in the heat treating plant to the furnaces, etc. The same condition may well apply to other plants. For example, when a stationary type of furnace is employed for most any operation, it will be found that that furnace is necessarily large and occupies considerable space.

(Continued on page 495)

# Good Will and Institutional Advertising*

## Advertising to sell service merchandise and securities all promote good will

*Bernard J. Mullaney*
Vice-President, the Peoples Gas Light & Coke Company, Chicago.

MY always first reaction to this subject is an impulse to ask:

"But what is "Good will and institutional advertising," as distinguished from "Advertising"?

Perhaps the impulse is only the outcrop of a naturally cantankerous and contentious spirit, but inability to suppress it persists, so it has to come out as part of me, "a poor thing," maybe, "but mine own."

We say those words, "good will and institutional advertising," and hear them said frequently—and usually ponderously—as if they meant something profound or even occult. There we seem to stop.

### Defining the Subject

Has anybody ever defined either "Good Will Advertising" or "Institutional Advertising" in terms that were more than an obvious platitude? Has anybody ever defined either of them in terms that expressed a definite mental concept of something distinctive and special in advertising—especially impressive, especilly convincing, especially resultful, or otherwise especially significant? If anybody has done so, I have muffed it. Therefore:

"Out of the night that covers me,
Black as the pit from pole to pole,"

Iask you, why should we dribble time and words in discussion of "Good Will," "Institutional" or any other languageous variety of advertising, where there is all too little time within the short span of an average life in which to explore the potentialities of plain, old-fashioned, home-grown advertising—just ADVERTISING?

### The Explanation of Good Will

The term "good will," used in relation to a business enterprise, has a fairly definite meaning that is recognized in law. It connotes the intangible assets—the actual although intangible property value—accruing to a going business by reason of its very existence, including such details as its name, its location, perhaps, its established clientele or patronage, its business methods, its reputation, its labels and trade-marks, and so on.

Obviously, therefore, if "good will advertising" means anything, it would seem to mean the kind of advertising—any kind of advertising—that tends to enhance the value of any or all of those intangible assets. Also obviously, "institutional advertising" would seem to mean any kind of advertising that is advantageous directly or indirectly to the institution—be it a man, a firm, a corporation or an industry—that profits by the advertising.

So, again I ask you: Isn't the doing of that—enhancing the value of the intangible assets and promoting the general good will of the institution—a large part of the every-day job of old Geo. W. Advertising, the pioneer and the founder of the Advertising industry, and still the boss of the works? And if it is, why try to make old Geo. W. Advertising work all dressed up in a frock coat and a plug hat and cuffs on his ankles, when he can work so much better in his shirt sleeves?

### Three Purposes of Utility Advertising

Advertising is an experienced and versatile helper for use in all branches of the public utility industry, always ready to be put to work at one or more of three well-defined jobs:

(1) To sell our service, no matter what branch of the industry may be ours.

(2) To sell merchandise and appliances if we are a gas or electric company with merchandise and appliances to sell.

(3) To sell our securities, especially if we are promoting Customer Ownership.

Let us consider these from the Biblical viewpoint: "The last shall be first."

### Advertising to Sell Securities

When advertising is employed to sell securities, if it is to be effective, it must necessarily exploit the good points of the company—its resources, its volume of business, its opportunities for more business, its policies, its management, and so on—all tending to guarantee its earning power. If this is not "good will" advertising, what is it?

If we are using advertising to sell merchandise and appliances—gas ranges, water heaters, clothes dryers, electric fans, washing machines, vacuum cleaners—the advertising that does it most effectively is advertising that tells the prospective buyers the good they will get out of the merchandise or appliances. In this, again, the advertising is most effective when it carries a suggestion of the business methods, policies, desires and resources of the company that stands back of the advertising. It is, for example, obvious, when pointed out, that the gas company or the electric company is interested that the gas-burning or electricity-using appliance shall give the best possible service to its owner lest dissatisfaction react upon the gas or electric service that makes the appliance "go"; pointing out this fact is a logical corollary to advertising the merits of the appliance itself. When this is pointed out with the further assurance (always to be made good of course), that the selling company will insure satisfactory working of the appliance, the inevitable re-

*Delivered at the Public Utilities Advertising Association Departmental, Associated Advertising Clubs of the World, Houston, Texas, May 13, 1925.

action is in the direction of enhancing the intangible assets that constitute "good will." Again, if this is not "good will" advertising, what is it?

### Advertising to Sell Service

In my judgment, advertising to sell our service so that new customers may be attracted and so that old customers may use more of it, is, and should be, no different in kind from advertising to sell any other commodity—breakfast foods, men's clothing, tooth paste, chewing gum, and what not.

The advertising that sells our service most effectively is advertising that tells the possible customer, who is not using it, how he can use it to advantage, and that tells the existing customer how he can use it, and more of it, to still greater advantage. It tells the housewife how her home cares can be eased and her social activities facilitated by the use of our service, whether the service be gas, electric, telephone or transportation. It transmits a similar message to the man of the house. It points out to the business man ways in which our service can be used to save money, quicken operations or otherwise facilitate his business. It even goes the length of telling both old and new customers the shortest, easiest and most expeditious and altogether satisfactory ways of making use of our service, as when a first installation of it is desired, when the customer moves, when he wants to discontinue service on account of protracted absence or otherwise, or when he wants to take up any detail of business with us.

Always this advertising, when it is most effective, carries a suggestion, but seldom more than a suggestion, of the resources in money, in plant and equipment, in business organization, and in the multiplex details of management which contribute to making the service available and efficient. If advertising in this way to sell our service is not "good will" advertising, tending to enhance the intangible assets of better understanding and appreciation of our service and satisfaction with it, then I have misread the dictionary definition of "good will."

### Another Viewpoint

I am well aware of an impression in some quarters that "good will" or "institutional" advertising for a public utility company is entirely different from the conception sketched herein; that it should exploit the industry or a particular branch of it as a beneficence for which the user of our service should go down on his knees every night and thank God; that it should breathe a spirit of passionate devotion to serve humanity as its greatest objective, and more of similar character. That kind of advertising, it seems to me, is never highly effective because it lacks focus upon the one thing that is of most interest to our customer; which is what our service can do for him; it is apt to be unconvincing because it lacks obviously logical sincerity. It is, in my judgment, to be shunned because, unless done very much better than most of us can do it, the finished product reads like bunk, and bunk is not an effective promoter of "good will."

### Conclusion

We cannot escape the conclusion, it seems to me, when we look the facts in the face, that intelligent and consistent employment of plain, every-day ADVERTISING in the selling of securities, of merchandise and appliances and of service, is, in the long run, the best kind of "good will and institutional advertising." If we utilize the latent opportunities inherent in these three distinct fields of advertising activity, the inevitable result will be enhanced "good will" for the "institution," whether the institution be a company, a special form of utility service or an entire public utility industry.

# Are You Remodeling Your Home?

***Don't Overlook These Two Big Improvements***

**Better Gas Piping** — You're planning to make your home more complete than ever before. Provide for extending the gas piping. Do this early. There should be a gas outlet in every room so that you can add a radiant heater or other appliance anytime without extra expense for piping. Plan for a better laundry, too, and pipe it for gas water heater, gas ironer, laundry stove, etc.

**Some New Appliances** — Don't put your old coal stove back into that nice clean, newly decorated kitchen. In your like-new home, use an efficient modern gas range. And how about your furnace heating? You can do it better with gas. Of course your home will have an up-to-date hot water heating system, too. Let us help you plan just what appliances will be most useful.

***Our easy terms are especially convenient when money is tied up in building or remodeling property. No trouble whatever to arrange for this service.***

**(Your Name and Address)**

A.G.A.-407

*Advertising Gas on Moving Day Appeal*

# Collecting Bills and Avoiding Complaints

## How to collect past-due accounts and keep customers satisfied

*L. O. Gordon*

General Manager, Interstate Power Company, Albert Lea, Minn.

WE in the business of furnishing to the public a necessary service have a serious duty to perform, and we are accountable directly to the people of our respective communities for the proper conduct of our business in return for the confidence that has been shown in granting us the privilege of using the public streets. We cannot hope to fulfill our obligations and conduct successful business enterprises unless our relations with our customers are right. Our public relations are the very foundation on which our business structures are built. It is impossible to secure the support of the people in maintaining adequate rates necessary for financing extensions and improvements, unless our service is the best that it is possible to furnish, and in all our dealings we so conduct ourselves that we secure the confidence of the public.

Our public relations are a matter of public confidence. No business can thrive today without the confidence of its customers. The public responds quickly and decisively if its confidence has been gained. The recent election of President Coolidge by the most overwhelming majority of any President was a testimonial to the confidence people had in the honesty and integrity of the man.

### Proper Public Relations Require Co-operation of All

Proper public relations cannot be maintained unless all departments responsible for service and those that come in contact with the public measure up to their full responsibilities. Two of the most important departments from the standpoint of public relations are the complaint and collection departments. It is through our monthly bills that we come in direct contact with all of our customers. Our gas bill touches the customer's pocketbook and when you touch a man's pocketbook you find him the most critical. He is purchasing a commodity or service which he cannot see, which is not measured out before him at so much per pound or per yard or by any other standard with which he is familiar.

If his bill is higher than previously or averages higher than a neighbor who has a larger family, he very naturally blames the trouble on the measuring device, the meter, about which there is in the public mind a great deal of suspicion. To him it is a tin or iron box full of mysterious wheels, mechanisms and noises that may take a diabolic notion to suddenly race at a terrific speed, piling up gas charges for the benefit of the stockholders, whom he perhaps assumes to be sitting in easy chairs, smoking fat cigars in beautifully appointed offices in Wall Street.

It seldom occurs to the customer that the natural tendency of any meter is to run slow rather than fast and that the company must maintain its meters in good repair and as nearly accurate as possible in order to avoid a possible substantial loss.

One cannot blame the customer for looking askance at the meter, for it is the yard-stick by which he buys his gas service and, being unfamiliar with its construction and operation, his natural inclination is to lay the responsibility for high bills at its door.

The fact that the company is a corporation which the political spellbinder has perhaps taught the customer to believe is soulless, and the fact that the company has no competitor to whom he can turn for gas service if dissatisfied may cause him to think that the company is taking advantage of the situation and using methods that are not considered ethical in business today.

### Only Cure Is Education

There is only one cure for this situation and that is education. This starts with the employee and must be carried on to the customer by every means possible. Every employee of the company should be familiar with the construction and operation of a meter and the accuracy that is maintained over a period of years. Each employee should know the policies of the company with reference to the reading, testing and maintenance of meters. With a knowledge of these things he is in a position to intelligently answer any question or criticism that may be advanced by the customer.

The meter reader is an important personage in a public service company. One of the best paying investments a company can make is the employment of efficient and honest meter readers. As this type is sometimes hard to find, sufficient salary should be paid to secure a man whose integrity is above reproach. He should be the kind to inspire confidence in the consumers as he comes in personal contact with each of them and is subject to suspicion in case of a high bill. If his work and conduct is such as to secure the confidence of the customers a great deal of suspicion is removed and the customer turns elsewhere for the reason for the high bill.

### Checking the Meter Reader

With the employment of the very best meter reader we should not stop. His readings should be checked from time to time. His knowledge that he is being checked will keep him spurred to do his best work, prevent his falling before the temptation to "curbstone" his readings, and the customers will see that the company has a real interest in avoiding errors.

The meter reader should not give the customer the consumption as shown by the meter reading book. Some companies do not give him the previous readings so that he cannot figure the consumption unless he is keeping a record of previous readings of his

own. I think it is the custom of most of the small companies, however, to show the previous month's readings on the meter reading book, in which case the reader can figure the consumption. He should not give the consumption, but confine his information to the readings and let the customer do his own figuring. This avoids the possibility of the meter reader making an error which will mislead the customer. If such error is made in favor of the customer there will certainly be a complaint following the receipt of the bill from the office.

### Tact and Courtesy Required

The handling of high bill complaints requires the utmost tact and courtesy. One or more persons in the organization should be designated to take care of this class of complaints and these persons should be very carefully chosen. The one so selected for this task should be patient, resourceful, convincing, courteous and even-tempered. I think perhaps patience is the most important attribute of all.

We have all classes and kinds of people making up our list of customers. Most of them who complain believe their complaints are legitimate. Some people unfortunately are unreasonable, suspicious and even discourteous. The irate remarks of the disgruntled customer should not be answered in kind, but received with patient, courteous consideration. If the person handling the high bill complaint meets the customer properly he can inspire in that customer's mind a confidence in the honesty of the intentions of the company in such a way as to secure or maintain that customer's friendship.

The creed of one hotel man operating a number of large metropolitan hotels is, "The guest is always right." We should assume something of this same attitude in respect to high bills. Literally, the customer is not always right, in fact, in this respect he is seldom right, but our attitude should be such that he knows that we are honest in our intentions and will make an honest investigation and rectify the error in case one is found.

### Determining the Justice of the Customer's Complaint

It is unnecessary for me to say here what steps should be taken to determine the justice of the customer's complaint, for these are well known. The point I wish to make, however, is that we should show a willingness to investigate and correct possible errors. There is one thing we should be particular about, and that is, after an investigation is completed, the customer should be notified of the result immediately and not wait for him to come in the following month and complain that he has heard nothing from his previous complaint.

Prompt and thorough investigation and correction if error is found is absolutely necessary in order to maintain the customer's confidence. A frank acknowledgment of error should be made if such error does exist. A position that the company never makes errors is untenable and only creates suspicion in the mind of the customer. We should display a willingness to inspect the customer's appliances and make adjustments of them if necessary. Our customers should be satisfied that we are sufficiently interested in our service to be willing to assist them at all times in securing the most economical use of the gas.

### The Function of the Accounting Department

There is a responsibility in this connection which falls upon the accounting department in making sure that no bills are rendered to the customers which show a consumption substantially in excess of the customer's average, without first investigating the matter. If the investigation shows that the bill is correct, a letter or telephone communication to this customer calling his attention to the substantial increase in consumption will usually prevent a high bill complaint being registered.

### Collecting Past Due Accounts

The collection of gas accounts requires very much the same type of person as one handling high bill complaints. I think it is a practice of practically all gas companies today to send notices to delinquent customers immediately after the discount date calling attention to unpaid accounts. This notice brings in those customers who have been out of town or who have forgotten these bills. Most companies also use a second notice to be sent in case no attention is paid to the first, giving the customer a limited time in which to pay the account before service is discontinued.

The sending of these second notices should be handled very carefully. Some person in responsibility who knows the customers should carefully check over the list to whom second notices are scheduled to be sent. Oftentimes a personal letter, a personal or telephone call will get the desired check where a second notice would arouse the ire of a person friendly to the company, but who has perhaps neglected his bill and his first notice. The discontinuance of service is the last resort in the collection of an account and except in the cases of the chronic slow payer or dead beat should be used sparingly.

### Why Are Bills Unpaid?

It is the duty of the collection department to keep in touch with the customers as far as possible, so that they will know the reasons why bills are left unpaid. There are three principal reasons why gas bills are not paid: first, the customer has overlooked his bill or is out of the city; second, the customer has had some misfortune; and third, the customer is chronically slow or a deadbeat. The collection departments can soon learn into which class the unpaid bills fall. In the first case the matter of collections is a simple one. In the second case the utmost leniency should be shown that customer who is honest and has always paid his bills, but who meets with temporary misfortune. The deadbeat falls in a class by himself, has little standing in the

(Continued on page 488)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

# Lesson No. 73

## Heat and Change of State

### A Problem in Latent Heat

A little more complicated form of the problem is to determine the amount of heat that will be required to melt 1,000 pounds of copper when the initial temperature of the mass of copper is 60 degrees F. In this case the problem is made up of two parts. In the first part of the problem the temperature of

LATENT HEAT PROBLEM
Heat Required to Raise mass of Copper to Melting Point and Melt it.
Coppermass at 60°F.
A- Raising Temperature from 60°F. to 1892°F.
Heat Required= Weight of Copper x Temperature difference x Specific Heat=
1000 X (1892-60) X 0.0924
Mass of Molten Copper
B- Melting the Copper at the Melting Temperature
Heat Required= Weight of Copper x Latent Heat per Lb.
= 1000 X 77.4 = 77.400
Total Heat = 169.000+77.400=246.400 B.T.U.

the thousand pounds of copper is raised from the initial temperature of 60 degrees F. to the melting point, which is 1,892 degrees F. This means that the temperature of the copper mass is raised 1,892 — 60, or 1,832 degrees F. The amount of heat required to do this depends on the specific heat of copper, which is 0.0924. Multiplying this figure into 1,832, there is obtained 167 B.t.u., which is the heat necessary to bring one pound of copper to the melting point from 60 degrees F. The total heat required is 1,000 times this figure, or 169,000 B.t.u.

After the melting point is attained, enough heat must be added to the mass of copper to convert it into the liquid condition. In other words, sufficient heat must be supplied to take care of the latent heat of fusion of copper, which is 77.4 B.t.u. per pound. The total amount of heat thus required is 77.4 × 1,000, or 77,400 B.t.u. The entire amount of heat necessary to effect the entire operation is therefore 77,400 + 169,000, or 746,400 B.t.u.

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### SHOW CASES BECOMING WORK SHOPS WITH GAS AS FUEL

"Show case" factories, as well as bakeries, hotel kitchens and restaurants, have been made possible as a result of the increasing use of gas for industrial and commercial purposes.

Managements are no longer ashamed to invite the public behind the scenes for fear that a false impression will be created by cinders, smoke, ashes and all the other inconveniences resulting from the use of old-fashioned fuels. As a matter of fact, many restaurants and not a few bakeries have been quick to realize the advertising advantages of using gas. Meals are being cooked in the window, where all passersby can see, and a New England bakery has just adopted the idea as a publicity "stunt."

This bakery occupies a small store about 25 by 60 feet in size. This store not only serves as the bake shop, but also as the retail store. In addition to all the baking machinery, space is set aside for the counters and the accommodations of the customers.

In the show window is a 144-loaf rotary oven. This type of oven is used for the reason that it makes a very effective display. It is white enameled and presents a very pleasing appearance, and, being in the window, the people on the street can see the products as they are taken hot from the oven.

Without gas such a compact bakery would be out of the question, and it is obvious that the baking ovens would not make nearly as attractive a window display if a perfectly clean fuel like gas was not used.

## COLLECTING BILLS AND AVOIDING COMPLAINTS

(Continued from page 486)

community and can only be given the kind of treatment which he deserves.

### Accounting and Collection

The accounting department has a responsibility in connection with the collection department also. Before the account is turned over to that department it should be carefully checked to make sure that all cash postings have been made and that the account is actually owed. There is nothing disturbs a customer more than to have a collector call on an account which has already been paid.

If the high bill complaints and the collections are carefully handled a great many friends may be made for the company, while on the other hand if insufficient interest is shown, if the customer is neglected, if he does not receive the courtesy to which he is entitled, if arbitrary methods are used without proper consideration for the customer's viewpoint or situation, enemies will be made which will seriously affect the company's public relations.

# Promoting Sales of Industrial Gas

## A few pertinent facts aptly exemplified

*H. Howrad Smith*
Industrial Engineer, Boston Consolidated Gas Co.

RELATIVE to selling the gas idea, in my estimation, this is the first step, and the other steps are very closely allied. As I see it, there are five cardinal points in the sale of industrial gas: First, know the manufacture of gas, its component parts; second, know your man; third, know just what you can do; fourth, make the proper installation; fifth, see that the installation is kept at the highest point of efficiency all the time.

This can only be accomplished by the industrial man being on the job at all times. A case in point: One of our large consumers was approached recently by a concern having an attachment to place in the gas line. Our customer's answer to him was he would let him know. Our customer immediately got in touch with us and asked if we approved. We investigated and found it was not to our liking and said no, and the customer took our word and said no. Now this condition only came about by being on the job; in other words, our customer was sold on gas and has remained sold.

### Industrial Man Must Be Sold on Gas

Very true, the industrial engineer must have vision and imagination, but he must also have stick-to-itiveness and be convinced himself that his proposition is sound. A case in point: A concern not using gas, but having a potential use for considerable, at the suggestion of another of our large consumers, was asked to get in touch with our department. The proposition was a new use for gas applied in a new way. This was used for drying dextrine used on the flap of the envelope for sealing. After considerable thought and study of the proposition, this was accomplished. We not only made a new customer, but one that was perfectly satisfied.

The industrial consumer of gas must be given the best of attention and he will react greatly to the benefit of the company in public relations. As one of our customers at the beginning of our business relations made this statement: "Oh, you gas men; all you want to do is sell." But today that same man tells us that he was wrong and we are right, in that he is getting personal service. This frame of mind of the customer is only obtained by proving the fact that the industrial man is on the level.

### Be True With Your Customer

Another very important fact: Be true with your customer and he will be fair with you.

I have refused business where I knew the appliance the customer had in mind was not satisfactory for his work. This required considerable nerve, but I can assure you that it was the best in the end.

### The Time Question

The question has been raised a number of times that the industrial man spends a great deal of the time with a customer. This is very necessary, as by being in close contact with him you gradually see new uses for gas coming up continually. I remember very distinctly one plant. We had a very hard time entering this plant and after a long time managed to sell them a small soldering iron heater. This business has grown from that until today this same concern is using over a million cubic feet of gas per month, for all of their manufacturing departments, where they formerly used coal and oil, it is now complete gas.

In closing, let me leave with you these few thoughts. The industrial man must have the confidence and support of the executive of his company and you executives have it in your hands to further the sale and utilization of gas for the industries.

*A part of the discussion on this general subject read at the annual meeting of the New England Association of Gas Engineers.

# As The Journal Views It

## UTILITY REPRODUCTION COST

The prime factor controlling the welfare of any utility is the rate which it receives for its product, or for the service that it renders. From time to time public utilities, including the gas utility, have to appear before State bodies and argue pleas calling for an increase in rate. Such a procedure is generally surrounded with all sorts of special conditions and difficulties, for, while the average public service commissioner is, of course, of impartial mind, as he should be, there is always more or less of a political aspect to his position and, whether he wants to or not, this factor has some influence on the way in which he regards petitions presented by gas utilities, and others, for increased rates. Recently the utilities have seen the value of going direct to the public with their arguments when they want an increase in rate. They have seen the advisability of first convincing the public that its demands are reasonable. It has been found that when such a procedure is followed less difficulty is encountered with the commissioner than otherwise.

However, the important consideration in granting increased rates is, of course, the method used in determining the valuation of the property of the gas company, or other utility. Accordingly, the basis on which this valuation is calculated will determine largely whether or not a decision is made granting an increase in rate. Therefore, a recent decision made by a Federal judge, which is discussed below in an editorial furnished in the Chicago Journal of Commerce, is of considerable interest. It is also interesting to see the unbiased and clear manner in which this newspaper considered the entire question of the utility valuation and rate adjustment. The important point that is brought forth in the decision as described in the editorial is that of upholding the spot reproduction cost as the dominant element in public utility valuation.

The editorial is reprinted below:

"A recent decision by Federal Judge Geiger of Milwaukee, upholding spot reproduction-cost as the dominant element in public utility valuations, is a reflection of the newer American attitude toward public utilities.

"The utilities have gone to the people with their arguments. They have persuaded a large section of the citizenry that a public utility is clothed with a public interest, and that its continued prosperity mus be insured in order that the public may receive a full measure of service.

"The newer attitude is summed up in the belief that a man who owns stock in a public utility is in the same position as the owner of any other property; that he is entitled to an adequate return, and that an adequate return should be based on what the property is worth today.

"Spot reproduction-cost is one of the three factors considered by the Interstate Commerce Commission in its valuation of the railroads. The other facts are the original cost and the present depreciation book value—the last named being the result of putting certain original invested capital into improvements and then subtracting sums for wear and tear, but adding the amount of the natural increase in the value of the improvements, if there has been an increase; if there has been a decrease, the amount of it is deducted.

"A certain amount of weight is given by the Interstate Commerce Commission to each of these three factors—original cost, present reproduction-cost, and present depreciated book-value. But, in Judge Geiger's opinion, present reproduction cost should receive dominant weight."

# GAS WRINKLES

## Wrinkle No. 3

### Pacific Gas and Electric Company

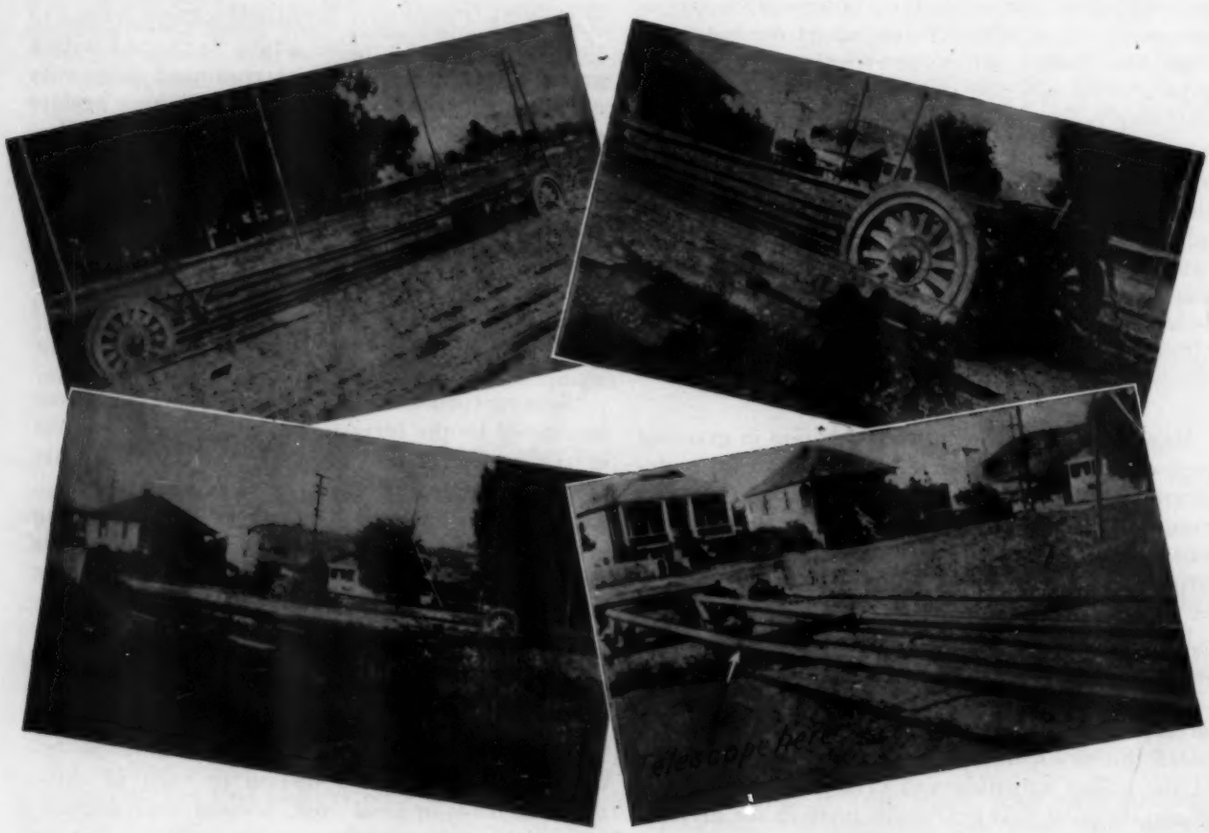
#### A trailer with adjustable frame

THE trailer, illustrated in the accompanying photographs, was designed to handle the hauling of pipe in 40-foot lengths recently received for a transmission line installed by the Pacific Gas and Electric Company.

The trailer consists of the running gear from an auto truck, to which is attached a sliding frame made of standard pipe with joints welded.

The forward section of the reach is made of 2½-inch pipe, which slides into the rear section, made of 3-inch pipe. When reach is telescoped, the length of the trailer is 15-foot and when extended the length is 25 feet.

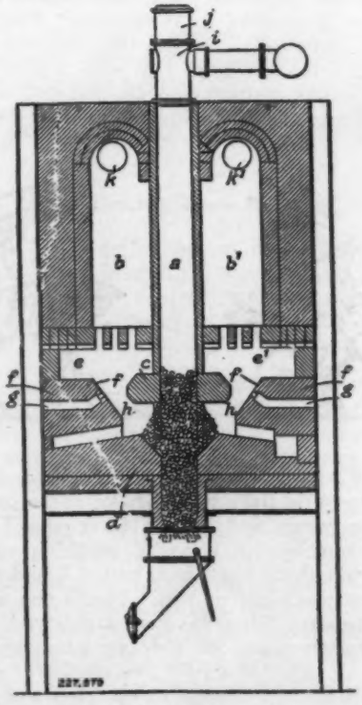
The frame is locked at any desired position by inserting bolts through hole provided at intervals.



# PROGRESS IN GAS TECHNOLOGY
## *Domestic and Foreign*

### MAKING WATER GAS WITH SUPERHEATED STEAM

IN this process steam is decomposed to produce combustible gas, which is partly used for heating the charge to be distilled and partly used for heating one of a pair of generators which are employed for superheating the steam before its admission to the charge. A number of rectangular firebrick retorts a are arranged in line in a setting, and a corresponding series of heating chambers, b, $b^1$, are arranged on both sides of the retorts. The retort is supported on a firebrick bridge c immediately over a receptacle formed in the lower part d of the setting. The upper part of the receptacle is flared outwards so that the charge may accumulate in it. Combustion chambers, e, $e^1$, are provided below the heating chambers b, $b^1$, and the brickwork f contains air conduits g which open into narrow spaces h between the brickwork f and bridge c. The heating chambers may be provided with the usual reticulated brickwork.




The coal is fed through the hopper j into the retort, and gas is drawn off through the pipe i. Steam is admitted at $k^1$ to the heater $b^1$ and raised to 850 degrees C. and then passes through the combustion chamber $e^1$ and space h into the charge below the retort. Part of the products of decomposition of the steam pass upwards through the charge in the retort to distil it, and the gases are drawn off at the top. Another part of the combustible gas passes into the chamber e and is burned with air supplied through the conduits g. The hot gases pass upwards into the heater z so that the brickwork becomes heated, and also the retort a by conduction. After a period, the steam supply is transferred to the heater b, and the combustion products are passed into the heater $b^1$ to reheat it. The temperature of distillation may be varied, e.g., it may be reduced to 750 degrees C., and an excess of steam used if it is desired to obtain the maximum quantity of oils and tar. If a maximum gas production is desired, the temperature may be raised to 1,200 degrees C.—(British Patent No. 227,879).

### EXAMINATION AND USE OF LIGNITE TARS

THE tar described, which contained 52.4 per cent of water and was dehydrated prior to further examination, had the following properties: yield of dehydrated tar from the lignite, 8 per cent; $d^{20}$, 1.024; viscosity at 50 degrees, 2.57; flash point, 98 degrees; ignition point, 123 degrees; solidifying point, +12 per cent; asphalt, 4.83 per cent; portion insoluble in benzene, 5.61 per cent; free carbon, 3.54 per cent; ash, 0.30 per cent; acidic oils, 45.0 per cent; gross calorific value, 9290 Cals.; net calorific value, 8815 Cals.

It was distilled under diminished pressure until resinous matter appeared in the condenser (temperature of vapor, 300-325 degrees), the residue then transferred to another still and destructively distilled, the distillate so obtained being added to that from the first distillation. The united distillate was mixed with acetone and cooled to remove paraffin wax, the acetone then removed, and the residual oil distilled with superheated steam until the still residue ("concentrate") had a flash point of 150 degrees. By this treatment the tar gave: "concentrate," 31.87 per cent, light oil 41.69 per cent (30.56 per cent after removing phenols), coke residue 8.89 per cent, crude paraffin wax (m.p. 46 per cent) 10.31 per cent, water and loss 7.24 per cent.

The original dehydrated tar was also submitted direct to distillation with steam at 200 degrees, the distillate being reckoned as light oil and the residue being treated successively with heavy petroleum and acetone to remove asphalt and paraffin wax. The purified residue was then destructively distilled, and the distillate treated with acetone and finally distilled with steam, light oil and "concentrate" being obtained. The results by this second method of examination were: neutral "concentrate" 28.62 per cent, neutral light oil 28.02 per cent, phenols 12.13 per cent, bases 1.83 per cent, coke residue 9.38 per cent, crude paraffin wax (m.p. 48 degrees) 12.3 per cent, water and loss 7.72 per cent.—(Chemiker Zeitung 37, 878-882).

# GAS MERCHANDISING

*Domestic – Industrial*

# Ideas for the Man Who Sells

*William H. Matlack*

## DRESSING UP OLD THEMES

THE Illinois Power & Light Corporation, operating in central and southern Illinois, are using a series of newspaper advertisements that are designed to promote the use of gas by such headlines as, "Gas Is Best for Cooking," "When the Cooking Is Done, etc.," and "Gas Is Inexpensive,"

Gas is
Inexpensive
If It's Done with Heat You Can Do It Better with Gas.
One gas burner can be burned for one hour at the surprisingly low cost of a few cents.
And what is more, there is no waste heat. You turn off the gas when you are through with it and only pay for what you use.
These are just two reasons why many home owners find it cheaper to cook and heat with gas.
Gas is best for cooking.
ILLINOIS SERVICE
Illinois
Power and Light
Corporation
DU61

giving a new twist to old themes that all gas men who have written advertisements have used time and time again. The Illinois company has a layout that is distinctive, as may be seen from the advertisements that are reproduced here.

## WHAT IS NIPPLE CONNECTION?

"WHAT is a nipple connection, and why do I have to pay for anything that is 'over a nipple connection'?" To gas men that sounds foolish, "What is a nipple connection?" but to the home manager it is a very vital and perplexing question. She is not a gas man and naturally, when she purchases a range, signs on the dotted line and puts out the three dollars as a down payment and the salesman says, "Now that is with a nipple connection and anything over that will be billed you at 45 cents per foot," "Why, don't you connect the range?" she asks. Then the salesman has to go through a lot of "well, you sees, and ifs, and buts," and the home manager—well, she gets disgusted and says, "Law, me, if I'd known all this I'd gone down

to the Famous Furniture Company and bought my gas range and they would have come out and delivered the range and connected it up. I would have been through with it and I would have known exactly what it all cost, how much I had to pay down and how much per month. That's the way with the gas company; they have so much red tape a body never knows what she's doing when she buys from them."

This little story came to us from a man who sells for one of the big gas companies and it seems to us we have heard something of the kind before. It seems some other salesmen have told us that selling would be much simpler if that gas company could come to selling on the same basis that the furniture store and the department store get down to—the price is for the merchandise delivered and installed, ready for us—no ifs, ors, ands, buts or was's.

# Catechism of Central Station Gas Engineering in the United States

## Installment No. 73

(Continued from last week)

If the limestone contains from 10 per cent to 20 per cent of clay mixed with carbonate of lime, the lime produced is said to be argillaceous, while if the limestone contains from 12 per cent to 18 per cent of silica, the resulting lime is said to be silicious. Hydraulic lime will slake and its paste, or a mortar made from it, will harden under water and in damp places.

Hydraulic cement is the substance obtained by calcining a mixture of clay and carbonate of lime in the proper proportions at a high, long-continued heat and then reducing the lumps produced by this calcination to a fine powder by grinding them between millstones. A paste or mortar made from hydraulic cement has the property of setting or hardening under water or in damp, moist places, and increases in strength as it increases in age.

Natural hydraulic cement is made by calcining and grinding limestones, which contain approximately the proper proportions of clay and lime, that is, from 20 per cent to 22 per cent of clay, and from 78 per cent to 80 per cent of carbonate of lime, $CaCO_3$.

### Making Lime Mortar

352. What are the objects sought in mixing sand with lime in making lime mortar, and with cement in making cement mortar, and what are the qualities required in a hand to fit it for use in making mortar?

Ans. "Sand is mixed with lime or cement to reduce the cost of the mortar, and is added to lime also to prevent the cracking which would occur if lime were used alone. Any material may be used to dilute the mortar, provided it has no effect upon the durability of the cementing material and is not itself liable to decay. Pulverized stone, powdered brick, slag, or coal cinders may be used; but natural sand is by far the most common, although fine crushed stone, or 'stone screenings,' is sometimes employed and is in some respects better than natural sand.

"To be suitable for use in mortar, the sand should be sharp, clean, and coarse; and the grains should be composed of durable minerals, and the size of the grains should be such as to give a minimum of voids, i. e., interstices between the grains.

"The usual specifications are simply: 'The sand shall be sharp, clean and coarse.'

"Sharp sand, i. e., sand with angular grains, is preferred to that with round grains because (1) the angular grains are rougher and therefore the cement will adhere better; and (2) the angular grains offer better resistance to moving one on the other under compression.

### Determining Sharpness of Sand

"The sharpness of sand can be determined approximately by rubbing a few grains in the hand, or by crushing it near the ear and noting if a grating sound is produced; but an examination through a small lens is better. Sharp sand is often difficult to obtain, and the requirement that 'the sand shall be sharp' is practically a dead letter in most specifications.

"Clean sand is necessary for the strongest mortar, since an envelope of loam or organic matter about the sand grains will prevent the adherence of the cement. The cleanness of sand may be judged by pressing it together in the hand while it is damp; if the sand sticks together when the pressure is removed, it is entirely unfit for mortar purposes. The cleanness may also be tested by rubbing a little of the dry sand in the palm of the hand; if the hand is nearly or quite clean after throwing the sand out, it is probably clean enough for mortar. The cleanness of the sand may be tested quantitatively by agitating a quantity of sand with water in a graduated glass flask; after allowing the mixture to settle, the amount of precipitate and of sand may be read from the graduation. Care should be taken that the precipitate has fully settled, since it will condense considerably after its surface is clearly marked.

"Although it is customary to require that only clean sand shall be used in making mortar, a small quantity of very finely powdered clay will not materially decrease the strength of the mortar. In some instances clay to the amount of 10 per cent of sand seems not to decrease the strength of the mortar. Mortar containing considerable clay is much more dense, plastic and water-tight; and is occasionally convenient for plastering surfaces and stopping leaky joints. Such mortar is not affected by the presence of water.

### Use of Coarse Sand

"Coarse sand is preferable to fine, since (1) the former has less surface to be covered and hence requires less cement; and (2) coarse sand requires less labor to fill the interstices with the cement. The sand should be screened to remove the pebbles, the fineness of the screen depending upon the kind

of work in which the mortar is to be used. The coarser the sand the better, even if it may properly be designated fine gravel, provided the diameter of the largest pebble is not too nearly equal to the thickness of the mortar joint.

"If the voids are filled with cement, uniform coarse grains give greater strength than coarse and fine mixed; or, in other words, for rich mortar coarse grains are more important than small voids. But if the voids are not filled, then coarse and fine sand mixed give greater strength than uniform coarse grains; or, in other words, for lean mortar a small proportion of voids is more important than coarse grains.

"As a rule, the sand ordinarily employed in making cement mortar is much too fine to give maximum strength, or to permit the use of a minimum amount of cement.

"The smaller the proportion of voids, i. e., the interstices between the grains of the sand, the less the amount of cement required, and consequently the more economical the sand.

### Use of Fine Sand

"Very fine sand makes a much weaker mortar than coarse sand, and natural sands vary considerably in the proportion of voids and consequently differ in the amount of cement required to produce any particular strength. Therefore, before adopting a sand for a work of any considerable magnitude, all available sands should be carefully examined with reference to (1) their effects upon the strength of the mortar, (2) their per cent of voids or the amount of cement required with each, and (3) their cost. If mortar of any particular strength is desired, the proportion of cement should be adjusted according to the fineness and voids of the best available sand." (Baker's Masonry Construction.)

### Qualities of Good Mortar Lime

353. Give the characteristics of a good mortar lime, and describe the preparation and use of lime mortar for brick-work construction with the precautions to be observed to insure the greatest possible strength for the finished work.

Ans. "Good lime may be known by the following characteristics:

"1. Freedom from cinders and clinkers, with not more than 10 per cent of other impurities, as silica, alumina, etc. 2. Chiefly in hard lumps with but little dust. 3. Slakes readily in water, forming a very fine smooth paste, without any residue. 4. Dissolves in soft water, when this is added in sufficient quantities. These simple tests can be readily applied to any sample of lime.

"The lime which, as indicated above, should be in hard lumps with but little dust, must first be slaked and made into a paste. The ordinary process of slaking lime consists in placing the lumps in a layer 6 or 8 inches deep in either a water-tight box or a basin formed in the sand to be used in mixing the mortar, and pouring upon the lumps a quantity of water 2½ to 3 times the volume of the lime. Sand in proper proportions is spread evenly over the paste thus made, and the ingredients are thoroughly mixed with a shovel or a hoe, usually the latter, a little water being added occasionally if the mortar is too stiff. It is best to mix the mortar stiff and thoroughly drench the brick before laying, as mixing the mortar thin interferes with its setting, and still more with its adhesion to the brick. Watery mortar also contracts excessively in drying (if it ever does dry), causing undue settlement, and, possibly, cracks or distortion. Wetting the brick before laying also removes from the surface dust which otherwise would prevent adhesion.

### Use of Water Regulated

"In slaking the lime the quantity of water used should be carefully regulated. Too much water reduces the slaked lime to a semi-fluid condition and injures its binding qualities. If too little is used in the first place and then more added after the slaking is well under way, and a portion of the lime already reduced to powder, the temperature is suddenly depressed and the lime chilled, rendering it granular and lumpy. It is also very important that the lime should not be stirred while slaking. The essential point is to secure the reduction of all the lumps. The common limes contain impurities which prevent a thorough, uniform and prompt slaking of the entire mass; hence all the lime necessary for any required quantity of mortar should be slaked at least one day before being incorporated with the sand, to avoid all danger to the masonry from subsequent enlargement of volume and change of condition. The paste should be protected from the air by being covered with sand until used.

"As a paste of common lime sets or hardens very slowly, even in the open air, unless it be subdivided into very small particles or films, it is important that the lime paste in common mortar should be but slightly in excess of what is sufficient to coat all the grains of sand and to fill the voids between them. If this limit be exceeded the strength of the mortar will be impaired. With most sands the proper proportions will be from 2.5 to 3 volumes of sand to 1 volume of lime paste. Generally, if either less or more sand than this be used, the mortar will be injured, in the former case from excess of lime paste, and in the latter from porosity." (Baker, Masonry Construction.)

For precautions as to the quality of sand, see answer to question No. 352.

### Qualities of Different Cements

354. What distinguishes "Portland" cement from "Rosendale" and other "natural" cements?

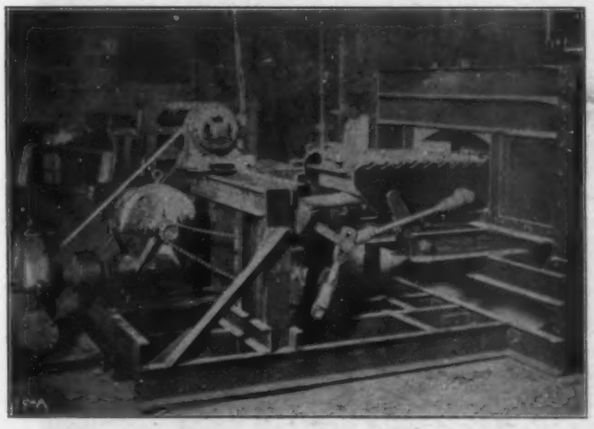
(Seventy-fourth Installment Next Week)

## THE FUEL OF THE FUTURE—WHAT SHALL IT BE?

(Continued from page 482)

The size of the furnace also connotes that a special part of the plant must be set aside for the heating operation and that the articles manufactured in the machine shop or other parts of the plant must be transported from the point of manufacture to the heat treating room.

Thus there are in reality two losses involved in the use of stationary furnaces—loss of available valuable space and loss of time in transportation—losses which can be completely avoided by the use of continuous automatic furnaces. These furnaces are much smaller, occupy so little space that they can be located in the same room where the manufacturing is accomplished or very close to it, with the result that a large saving can immediately be effected in the release of space and elimination of cost of transporting the finished articles ready for heat treatment. It must be emphasized at this point that if a coal-fired or oil-fired furnace were used, it would be impossible to locate it in the machine shop, due to the fact that much dirt, smoke and heat are attendant and unavoidable circumstances in the operation of such apparatus.



*Transporting Device on Cam Shaft Hardening Furnace*

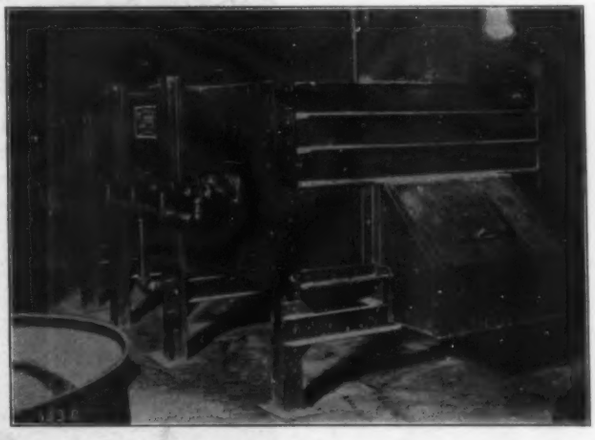
The other important saving is the labor involved in tending the furnaces. This labor is more or less unproductive in any operation and its elimination, which is accomplished by the use of a gas-fired, automatically-controlled apparatus, forms a considerable saving, aiding, together with the saving in space, to amortize the installation within a comparatively short time.

### Advantages of Automatic Heat Treatment

While the use of an automatic heat-treating furnace possesses advantages of an economic character, as described above, the benefits that are gained therefrom do not stop at this point. There are also certain very important technical advantages that are obtained by the use of such apparatus. Before proceeding to their discussion, it must be mentioned that in any operation in which heat is employed it is genarally true that a mechanically operated apparatus, provided with proper temperature controlling devices, will give results that are more advantageous from a purely technical standpoint than the stationary type of hand-controlled and hand-fed apparatus. Thus the advantages which will be enumerated below as applying to the heat treatment of metals may be applied to other cases in which gas is advocated as an industrial fuel.

### Crudity of Existing Apparatus

One condition which pertains to the heat treating field and which is common to most operations in which heat is employed is the crudity of the appa-



*Cam Shaft Hardening Furnace*

ratus now used. This apparatus is mostly of the stationary type and all the operations are carried out by hand, a time-consuming and costly practice. That this should be so is a commentary on the progress of the heating industry. It is simply due to the fact that fuel has been so cheap that it has appeared to the plant manager that no saving of any real consequence could be made along these lines. This is an entirely erroneous conception of the heating operation, for while the consumption of fuel may be held to be inconsequential, the labor expense and other costs, brought about by a high percentage of spoilage, are considerable. Thus it is not at all strange to see really crude methods employed in the heat-treating operations in most modern automobile plants, where all other operations are carried out with the aid of highly complicated, expensive, automatically operating and automatically controlled machinery.

There is no question but that the use of automatic machinery, no matter what the initial cost might be, is justified by the savings that eventually accrue. It is really strange that the same reasoning is not generally applied to the heating operations in which the type of automatic machinery employed is not in any way as complicated nor as expensive as that used in mechanical operations.

The use of the hand-controlled and hand-operated furnaces in the heat treating room results in increased costs of all kinds, due to the necessity of re-routing the material and the fact that goods must be stored because of interruption in the smooth flow of the manufacturing operations.

### The Metallurgical Side of the Problem

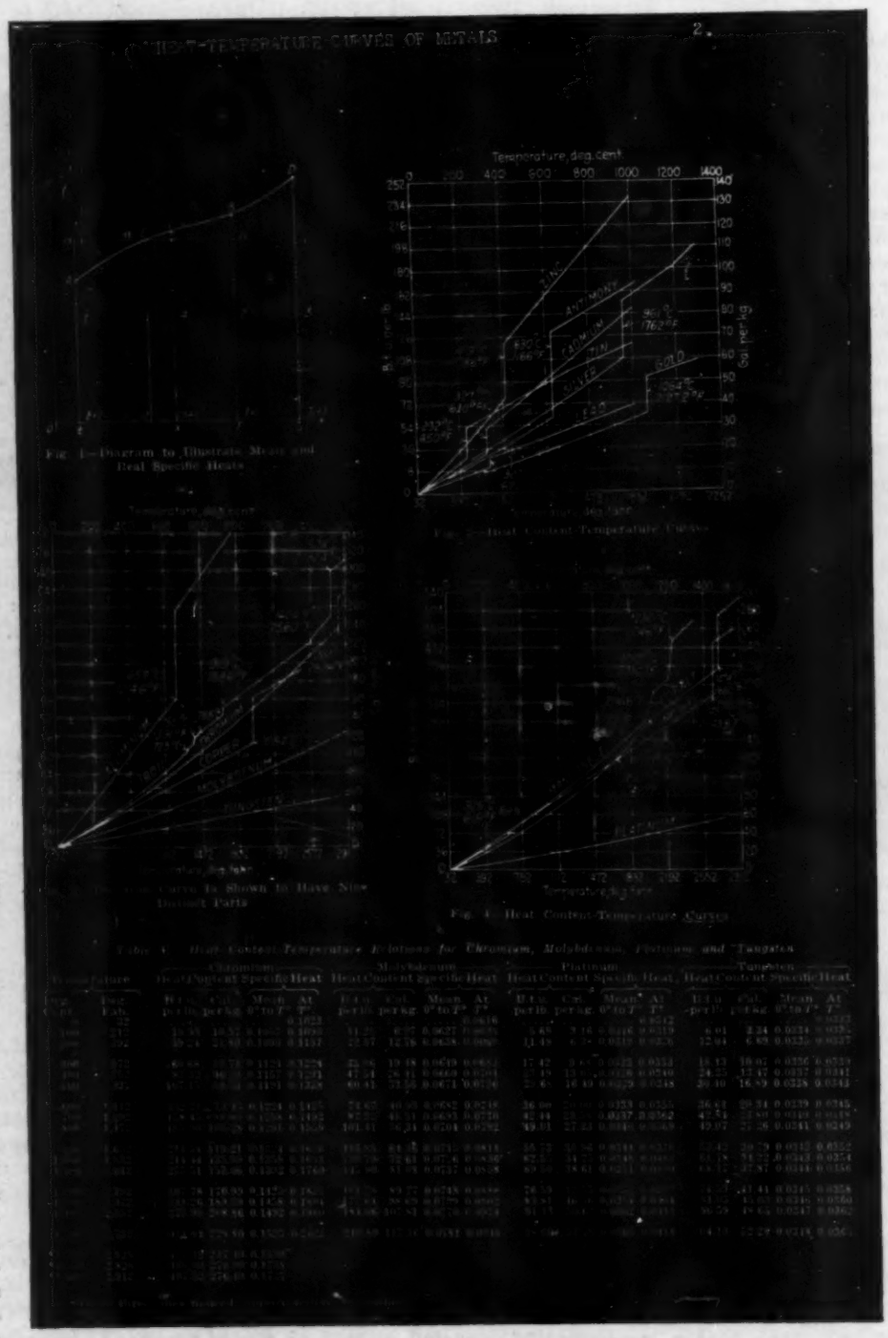
It has been mentioned that automatic heat treatment possesses certain technical advantages. The same is true of any heating operation which is carried out in a gas-fired and automatically controlled furnace. What these technical advantages are in other applications of gas to manufacturing processes will be discussed in the proper place later on. We are now concerned with the technical advantages of automatic heat treating of metals.

Any number of metal parts, such as cams, crank shafts, axles, etc., are heat treated and one of the principal problems in the process is to avoid the warping of these articles while under treatment. It is understandable that when the metal part is being rotated while in the heat-treating furnace the chances of its warping are materially reduced. This can be accomplished satisfactorily in the automatic furnace.

### Uniformity of Heating

Another important characteristic of the heat-treating process is uniformity. Irregular heating gives very bad results. This is usually the case in the old type of stationary furnace. In such a furnace some of the articles would necessarily be located near the door, others near the side walls or end walls and, accordingly, they would be subjected to different temperatures, with the result that the heat treatment would be irregular. This disadvantage is entirely avoided when the automatic furnace is employed, for in this case as the parts are being moved through the furnace from one end to the other, they are all subjected to exactly the same conditions, which means a finished product which is uniform throughout.

The importance of uniformly treated metallic




*Heat Temperature Curves of Metals—Curve No. 2*

parts that have to undergo severe strain is apparent to every engineer who has to use them in building his machine. Furthermore, the automatic furnace makes it a practical certainty that every part that is processed in it is heat treated alike and that, therefore, the same results may be expected from one as from the other. This is an important advantage, for it has been with considerable difficulty that any such uniformity of treatment could be obtained from the stationary type of furnace, or, rather, from the furnace that was more or less of a makeshift, fabricated perhaps by the mechanics on the very plant where it was employed.

### Taking Heat Treatment Out of the Realm of Empiricism

There is no question but that heat treatment of metals is an operation which requires the strictest kind of control in order to obtain consistently good results. It cannot be looked upon as a hit-or-miss proposition and whenever it is treated in such a fashion disaster is sure to ensue. It is not only the fuel that is important, but the furnace as well, and it is to the credit of the electrical man that he has done so much in educating and convincing the manufacturers that they cannot hope to obtain good results in apparatus that is thrown together by someone on the plant who thinks he understands heat treatment and the design of furnaces wherein it is to be carried out. There is much more involved in the correct design of the furnace than might be supposed at first hand, and the bad practice of using empirical methods in heat treatment instead of those based on actual proven scientific principles, the false security given by the availability of a cheap fuel, the consumption of which did not matter as long as results were obtained, have now been supplanted in many establishments by the use of much more expensive fuel in a scientifically correctly designed furnace which gets all the practically available value there is in the fuel out of it. This is where gas shows its advantage over all other fuels, and electricity included, for while electricity may give as good results as gas, it is by no means as economical in the long run.

### The Saving in Fuel

The continuously-operated and automatically-controlled furnace affords, as well, advantages in the consumption of fuel which are of vital importance. The furnace is operated continuously and a process of such character is bound to give better results, as far as consumption of fuel is concerned, than one that is intermittent in operation. It is a fact that a great amount of heat is allowed to go to waste in any furnace. When a high temperature must be maintained therein it is connoted that the flue gases must leave the furnace at at least this temperature. Otherwise the temperature within the furnace cannot be maintained. This simply means that there is plenty of heat in the waste gases which can be put to good use.

The preheating of the metallic parts that are being heat treated is therefore essential to high thermal efficiency in the furnace. There is generally provided a means of heating the metal up to the desired furnace temperature before it enters the heat-treating chamber, and in the automatically operated furnace this is accomplished in a continuous fashion without loss of time or of heat.

### Comparison with the Electric Furnace

Such a furnace is so efficient that it need be compared only with the electric furnace designed for the same purpose, which is acknowledged to be a fine piece of apparatus. The electrical engineer has put a lot of thought and careful study of actual operating conditions into this work and has obtained good results. But, compared on an economic basis, and granted that both the electric and the gas furnace, when properly designed, will give equally as good technical results, the conclusion must be reached that the electric furnace is not by any means as efficient as the gas furnace. Thus gas-fired heat treating furnaces have been designed which will do the same amount of work with eight cubic feet of city gas of ordinary quality as one kilowatt of electricity. On the economic basis the gas-fired furnace, under these conditions, will give results which are equivalent to the electric furnace which is supplied with electricity at a little more than half a cent a kilowatt-hour.

### Radition Loss

Besides the loss of heat in the flue gases, which can be recovered as has been explained above, there is another loss which occurs in any furnace and which is of as much, if not greater importance, than the flue loss. This is the loss of heat due to radiation. The design of the furnace will go a long way towards determining the extent of such losses. Thus it will be evident that when the furnace is made too roomy there will be a better chance for radiation losses to be incurred than when the dimensions of the furnace are selected so that the part that is being treated is neatly accommodated without there being any excess clearance. The arch of the furnace should therefore be made as low as possible and with enough clearance, of course, so that the articles being heat treated may pass through without any difficulty. In an automatically operated furnace in which these articles are always located in the same position on the traveling conveyance which carried them through the apparatus, it is possible to reduce this clearance to a minimum and in this manner reduce the losses due to radiation in corresponding proportion. Another way in which high radiation losses may be reduced is through the use of heavy insulation.

### Burning the Fuel

It is, of course, clear that none of these precautions are worth while carrying through if the fundamental conditions in the utilization of gaseous fuel in a heat-treating, or, indeed, any heat-consuming furnace or apparatus are not fulfilled. This refers to the complete combustion of the fuel. The ratio of gas to air must be such that complete combustion ensues at all times. Burners have been designed which regulate this ratio automatically and

maintain it at the proper point, no matter at what rate the furnace is being operated.

All these conditions, carried out with accuracy and care, in the automatically operated furnace, make it a most effective apparatus, yielding high thermal efficiencies in all kinds of work, and particularly in the heat treatment of metals.

### Advantages in the Metal

The industrial gas engineer must know that in the heat treatment of metals there are certain conditions which control the quality of the product and that these conditions must be implicitly observed if correct results are to be obtained. Thus the rate at which the metal is heated, the length of time it is held at the proper temperature and the temperature at which it is quenched, we have shown in previous articles of this series, all play important parts in the heat-treating process. The method of heating, whether the metallic part is thrown into the hot furnace and subjected to sudden temperature rise or whether it is gradually brought up to the proper temperature by preliminary heating, which makes use of the waste heat in the flue gases that leave the heating furnace, also has a marked effect on the stresses and strains that are induced in the metal and on the physical properties of the finished product.

A continuous flow of product through the heating furnace at the proper rate to give the desired heating effect on the metallic structure means the production of heat-treated articles which are all of the same quality and are possessed of the proper characteristics. Once the rate of heating and the rate of travel of the parts through the heating furnace are established, it can be automatically maintained and uniform results when controlling conditions are kept constant will be consistently secured. Overheating is prevented, which not only means a waste due to the consumption of more fuel than is necessary for the process, but also connotes injury to the metal.

### Scale Formation

The formation of scale on the heat-treated article is always a matter of concern to the manufacturer. The gas man can guarantee that he can properly control the combustion of his fuel so that the products of combustion will not contain any free oxygen and, in fact, so that there will be found in them a small amount of unburnt fuel which will act as a deterrent in the formation of sale. Thus about one-half of one per cent of free carbon monoxide in the flue gases will have this effect, without at the same time causing any appreciable loss of fuel value by incomplete combustion. The establishment of a reducing atmosphere in the furnace is very good practice and it can be most readily accomplished by the use of gaseous fuel. This is a particularly important matter in the case of the heat treatment of metals and is a property of gaseous fuel to which the industrial gas salesman can call the attention of the manufacturer with absolute certainty of its being maintained during the entire heating operation.

### Design of the Furnace

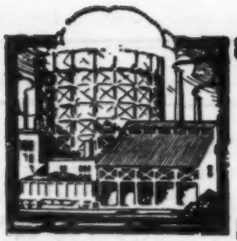
The specific details of the design of a heat-treating furnace will, of course, vary according to the local conditions in the plant, the character of the product that is being treated and the properties that are desired in the finished article. In the case in question, the heat treatment of cam shafts, it may be worth while to say a few words about a type of furnace that can be employed with good results for this purpose. The furnace is built of heavy steel casing, which surrounds fire brick walls. The discharge end of the furnace is provided with a discharge chute which allows the finished article to fall into the quenching bath. The furnace is fired for two-thirds of its length and burners are provided along both sides, firing into refractory bed pockets. Radiant heat is generated in this fashion and this heat is redirected and reflected in such a manner as to give uniform heat conditions across the entire width of the furnace. Automatic inspirators, which function in the same manner as the carburettor in an automobile, yield an intimate mixture of air and gas, and the proportions of the same are maintained constant, no matter at what rate the furnace is fired.

Automatic temperature control may also be employed in such a furnace. The actuating part of the pyrometer is inserted into the furnace and the current induced by the difference in temperature is caused to operate a valve which is closed when the temperature becomes too high in the furnace, thus shutting off the supply of fuel.

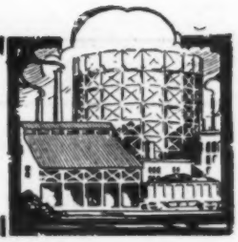
The feed mechanism of the furnace is, of course, specially designed to hold and convey cam shafts and may be seen in the accompanying illustration. The mechanism is made in such a fashion that not only are the cam shafts moved automatically through the furnace, but they are also rotated while they are thus moving. This insures the proper temperature being reached in all parts of the cam shaft at one and the same time.

### Conclusion

In conclusion, it must be pointed out again that this example has been given to indicate the manner in which the gas engineer and salesman may present his argument in favor of the use of gas as a fuel for some industrial purpose. The argument must be complete. It should cover the technical as well as the economic end of the problem. It should be represented that gas is the logical fuel, not only because of the technical advantages that are gained through its use, but also because it possesses certain economic advantages, especially in comparison with electricity. The mechanical improvement in the thermal process must form an intrinsic and important part of the argument, for the gas engineer must make a decided improvement in the entire process. If he simply advocates the use of gas without paying any attention to the manner in which it will be employed, he is only performing a part of his task. He must seek to make improvements and perfections in the process, and he will not find it so difficult to locate them.



# NEWS OF THE GAS INDUSTRY



## Michigan Gas Men Prepare Fine Program for 1925 Convention

The program of the 1925 convention of the Michigan Gas Association is as follows:

(Thursday, June 25)

9 a. m.—Registration, desk in lobby.

11 a. m.—Meeting called to order; reports of officers and committees; report of Prof. White on the Fellowship work at Ann Arbor; address of president; appointing of committees.

7 p. m.—Banquet, following which will be the joint meeting of the gas and electric associations under the auspices of the Michigan Committee on Public Utility Information. At this there will be an address by Arthur W. Stace on "What Is Coming in the Development of Michigan."

(Friday, June 26)

10 a. m.—"The Future of Gas in Industry," by H. E. Broughton and H. C. Haroldson, Jackson, Michigan; "House Heating Experiences," D. H. Frazer, Battle Creek; "Gas Rate Structure for Large Customers," F. A. Newton, Jackson; short talks on "Progress with Gas Ovens," at Zilwaukee, by R. H. Lawlor; at Battle Creek by F. W. Seymour; "Mixing of Gases of Different Gravity in Storage Holders," by T. W. Weigele, Detroit.

(Saturday, June 27)

10 a. m.—"Tying in with the National Program of the American Gas Association," by Kurwin R. Boyes, New York City; "The Use of Soft Coal in Water Gas Generators," Harry S. Parker, Muskegon; "Experience with Modern Gas Accounting Methods," P. H. Sanderson, Lansing; short talks on "Progress in Appliance Manufacture," John A. Weston, Detroit Stove Works, Detroit; "Physical Examination of Employees," A. G. Schroeder, Grand Rapids; "Co-operation in the Extension and Maintenance of Underground Structures on Public Highways," L. K. Richey, Detroit: reports of committees..

(Entertainment Program)

The entertainment committee consists of R. H. Lawlor, chairman, D. E. Karn, Edward Horry, George Steinwedell and the secretaries of the two associations.

The following tentative program has been outlined:

(Thursday, June 25)

9 a. m.—Registration. A fee of $5 per person will be charged at time of registration which will cover all entertainment as listed.

2:30 p. m.—Carriage drive around the island, covering all points of interest.

5 p. m.—Tea in parlors. Orchestra concert.

7 p. m.—Banquet. Orchestra concert.

10-12 p. m.—Dancing.

(Friday, June 26)

10 a. m.—Ladies' bridge party in hotel parlors during the time of business meeting.

2:30 p. m.—Trip to Les Cheneaux Islands in steamer. Orchestra will accompany us. Beverages will be served free of charge.

8 p. m.—Moving picture show in Casino.

10 p. m.—Dancing.

(Saturday, June 27)

No special entertainment program has been planned for this day. The orchestra will play at luncheon time; in the tea garden in the afternoon; at dinner, and for dancing.

### Manufacturers Section, A. G. A., Honor Late Will W. Barnes

At the meeting of the managing committee of the Manufacturers Section of the A. G. A., held at the Hotel Traymore, Atlantic City, N. J., on May 21, the following minute was unanimously adopted:

"In the passing of Will W. Barnes, the manufacturers have lost a member and the gas industry a man whose kindliness and qualities of good fellowship endeared him to us all. As the first secretary of the Manufacturers Section of the American Gas Association, by his ability he contributed greatly to the building of the foundation on which our present structure exists.

"We who have been associated with him greatly treasure having known him and wish therefore to express to his family our deepest sympathy."

## Public Utility Securities Now Selling at the Rate of $5,000,000 a Day or $212,000 an Hour

**In 28 Months Amazing Total of $2,800,000,000 of New Money Is Obtained from American Investors**

What constitutes perhaps the most remarkable record in the annals of corporate financing in this country was rvealed recently, when H. C. Abell of New York, president of the American Gas Association, made public a statement showing that during the first four months of this year the American people had invested their savings in the securities of public service companies at the almost unbelievable rate of $5,000,000 a day, $212,000 an hour or $3,500 a minute, Sundays and holidays included.

According to Mr. Abell, the most accurate data available shows that $611,000,000 of new money was obtained by the public service companies from the sale of securities to employees, customers and the general public from January 1 to April 30, 1925. With a continuation of this present rate of new financing, he estimates that approximately $1,825,000,000 will have been obtained by the gas, electric light and power, street railway, water, telephone and telegraph companies in 1925.

### New High Records

"While the figures for the first four months of this year establish new high records," he said, "they do not tell the real story of the tremendous development which has been going on in our business to take care of an unprecedented demand from the American people for the essential services of light, heat, power, water, transportation and communication.

"A veritable flood of gold has been pouring continuously into the public utility business for the last two years. In 1924, for example, $1,325,000,000 was invested in gas and other public service company securities. This was at the rate of $3,600,000 a day. In 1923 the total was $876,000,000, or at the rate of $2,400,000 a day.

"In other words, for the brief period of 28 months ended April 30 this year the huge total of $2,800,000,000 was invested in all branches of the public service industry by the thrifty men and women of America. To appreciate the immensity of this sum let me say that it represents the continuous flow of capital in our business at the rate of $137,000 an hour for 204,000 consecutive hours—a record which I believe is without a parallel in the history of our country. As these words are being read, the public is buying our securities at the rate of about $60 a second."

### Large Number of Utility Stockholders

Mr. Abell said that this money comes from millions of Americans, a large percentage of them customers and employees of the companies themselves. Latest available statistics show that the public utility industry has about 5,200,000 security holders, divided about evenly between stockholders and bondholders. The banks and life insurance companies hold about $4,000,000,000 of utility securities, which makes all the insurance policyholders, bank stockholders and depositors throughout the country vitally interested in properly maintaining public necessities.

"The most remarkable development, however, and one showing striking evidence of the faith of the American people in the principle of private operation of essential utility services under the present system of public regulation, is the tremendous growth in the number of customer shareholders," he explained.

"When the users of our service invest their savings in our securities, they not only evince faith in the honesty and integrity of the executive management of our business, but they believe that under such management the public service business will witness its greatest expansion—an expansion which will not only safeguard their investments, but assure them of the conveniences of life that every modern American demands.

"Since January 1, 1918, more than 800,000 users of our service have purchased the securities of their local companies, with the number growing by leaps and bounds at the present time. Today the public service companies have their securities more widely distributed than all the other industries of America combined. The direct results of all this remarkable expansion are that our relations with the public are on a better footing than ever before, that public regulation of our business is more reasonable and based upon sounder principles than at any time since the commission form of regulation began, and that our securities not only command the confidence of our customers, but enjoy a high standing in the financial markets of the world. Such a combination of favorable conditions is bound to assure a bright future for the public service business which will mean prosperity for America, for the two are inseparable."

## Canadian Gas Program Completed

The following is the program to be presented at the 1925 convention of the Canadian Gas Association:

1. "Notes on Recent Plant Extensions at Montreal," by H. N. Osler, superintendent Station "B," LaSalle Plant, Montreal Light, Heat & Power Co., Montreal, Que.
2. "Coke Ovens in a Canadian Gas Works," by Joseph Stevenson, M. E., superintendent Hamilton By-Products Coke Ovens, Ltd., Hamilton, Ont.
3. "The Value of Hotel and Restaurant Equipment Business," by Harry D. Schall, vice-president, Standard Gas Equipment Corp., New York.
4. "Heating Vertical Retorts with Coal Gas," by Frank Elcock, superintendent gas works, Ottawa Gas Co., Ottawa, Ont.
5. "Mankind's Greatest Discovery," by Alexander Forward, secretary manager, American Gas Association, New York.
6. "Electric Welding and Design of Gas Holders," by C. H. Scheman, manager Horton Steel Works, Ltd., Toronto, Ont.
7. "Coke Ovens in Medium-Sized Gas Works," by Hugh McNair, manager gas utility, Winnipeg Electric Co., Winnipeg, Man.
8. "Medium High Pressure Gas Distribution," by J. D. von Maur, engineer of gas distribution, Consumers Gas Co., Toronto, Ont.
9. "Back Run Results at Quebec," by R. A. Wallace, superintendent gas department, Quebec Railway, Light & Power Co., Quebec, Can.
10. "Home Service Work," by Miss Ada B. Swann, American Gas Association, New York.
11. "Waterless Gas Holders," by Henry L. Underhill, engineer gas department, Bartlett Hayward Co., Baltimore, Md.

### N. D. Lambert to Address Class of Meter Readers

Lambert Meter Co. announces that Mr. N. D. Lambert sailed May 30 for Galveston, Texas, where he had been invited by the Southwestern Gas Association in conjunction with the University of Texas, to assist in a short course for meter men of that territory.

# Pacific Coast Gas Men to Meet in Oakland

The program of the Oakland meeting of the Pacific Coast Gas Association was as follows:

10 a. m.—Call to order by President E. L. Hall; discussion on the material, quality and testing of gas fittings, led by R. S. Fuller, Pacific Gas & Electric Co.

12 Noon—Adjourn for luncheon.

2 p. m.—Call to order by President E. L. Hall; report of Home Service Bureau, C. R. Miller, chairman, Portland Gas & Coke Co.; discussion; report of Municipal Ordinance Committee, C. R. Miller, chairman, Portland Gas & Coke Co.; discussion; report on Appliance Certification Plan, President E. L. Hall; discussion.

(Evening Session)

6:30 p. m.—Informal dinner for members and guests, $1,.50 per plate, served at Business Women's Building. 1608 Webster street, President E. L. Hall presiding; prominent speakers, music, song, special features, providing inspiration, pleasure, fun, hilarity.

**F. S. Wade Made a Vice-President of Southern Counties Gas Co.**

Las Angeles, Calif.—The board of directors of the Southern Counties Gas Co. of California held a regular meeting recently at the utility's general offices in this city, when F. S. Wade, superintendent of operation for the company, was named a director, vice-president and manager of that organization.

Other changes in the official list of officers and directors resulted in naming A. Schilling of San Francisco as first vice-president. Mr. Schilling replaces C. O. G. Miller

*F. S. Wade*

of San Francisco as vice-president, the latter remaining on the board of directors, and Mr. Wade replacing Leroy M. Edwards as a director. Mr. Edwards, however, retains his place as general counsel for the company, a position he has held for a number of years.

Mr. Wade is widely known in the gas circles of the Pacific Coast and for the past 20 years has been identified with the gas business in Los Angeles and Southern California. Following his graduation from the University of Southern California at Los Angeles, he undertook the chemical control of the Los Angeles Gas & Electric Corporation's new plant. This was in 1905, and he remained in that important capacity until 1912.

When Ferdinand R. Bain, president and general manager of the then newly-organized Southern Counties Gas Company, was casting about in search of a right-hand man with a thorough knowledge of the gas business, he unhesitatingly selected Mr. Wade as his superintendent. He was at once placed in charge of the company's operations and has remained with this organization for 13 years.

Mr. Wade is widely recognized in the gas fraternity of the Far West because of his extensive gas research work. He was one of the pioneers in developing and marketing natural gas. He is a past president of the Pacific Coast Gas Association and a member of the American Gas Association.

Mr. Wade's friends, not only up and down the Pacific Coast, but in the East, rejoice at learning of his promotion.

The present officers and directorate of the Southern Counties Gas Company are as follows: Ferdinand R. Bain, president and general manager; A. Schilling, San Francisco, vice-president; Charles H. Dickey, New York City, vice-president; A. S. Bradford, Placentia, Calif., vice-president; F. S. Wade, vice-president and manager; W. S. McFarland, secretary and auditor; F. E. Kester, assistant secretary and assistant auditor; T. H. Dudley, treasurer, Santa Monica, Calif.; LeRoy M. Edwards, general counsel; M. R. Thompson, engineer, and A. F. Bridge, executive engineer.

# Southern Gas Association to meet next week

Secretary J. P. Connolly has announced that the Oceanic Hotel at Wrightsville Beach, N. C., has been designated as the official headquarters of the Southern Gas Association during its 17th annual convention, June 9, 10 and 11. The Committee on Papers, A. D. Whittaker, chairman, has arranged for the following papers to be read and discussed at the conventionff "Gas Production," by A. W. Young, Knoxville, Tenn.; "Gas Distribution," by C. J. Weinmerster, Atlanta, Ga.; "Industrial Gas," by F. F. Cauley, Chicago, Ill.; "Accident Prevention," by James B. Douglas, Philadelphia, Pa.; "Office Management," by Mr. Harris, Chicago, Ill.; and "Business Building," by E. D. Brewer, Atlanta, Ga.

Harry D. Schall, Baltimore, Md., has been elected vice-president of the Southern Gas Association, succeeding Oscar H. Fogg, resigned.

**W. N. Ryerson Joins U. G. I. Co.**

William N. Ryerson, recently assistant manager, public utility management department of Day & Zimmerman, Inc., Philadelphia, has entered the employ of the U. G. I. Co. as an assistant to Vice-President Hutchings.

Mr. Ryerson, who is a graduate of the electrical engineering department of Columbia University, started in the utility business with the Metropolitan Street Railways (Interborough Rapid Transit Co.) of New York. His next position was with the Ontario Power Co., Niagara Falls, Ontario, of which he was the first superintendent.

### Gas Men Active in Brooklyn Affairs

The gas industry in Brooklyn has been well represented in the civic affairs of the community for the past two years. Mr. Linford S. Stiles, construction engineer of the Brooklyn Union Gas Co., has been president of the Brooklyn Engineers Club for the last two years. He has the distinction of being the first president of that organization to be re-elected for a second term and, in fact, the constitution of the club was changed to make that possible.

The Brooklyn Engineers Club held their annual dinner May 20 at the Hotel Bossert, and incidentally celebrated their 29th year. The affair was a brilliant one and was marked by the initiation of a half dozen eminent Brooklynites as honorary members of the club, with fitting ceremonies.

Those thus honored were Elmer A. Sperry, president of the Sperry Gyroscope Co.; Hon. Joseph A. Guider, president of the Borough of Brooklyn; William H. Todd, president of the Todd Shipyards Corporation; Charles J. Obermayer, president of the Greater New York Savings Bank; William M. Greve, president of the Realty Associates, and Hon. William M. Calder, ex-United States Senator.

As retiring president of the club Mr. Linford S. Stiles welcomed the honorary members and each of them responded with a few well chosen remarks.

Mr. Calvin C. Hough, the newly-elected president, also spoke briefly and thanked the members for the honor bestowed upon him.

Mr. Thomas Matchett, a member of the club, proved an excellent toastmaster, and introduced the different speakers.

The Rev. Dr. W. Warren Giles concluded the speechmaking by a masterly talk on the Constitution, interspersed with many fine touches of wit and humor.

Mr. Stiles may well look back upon his administration of the past two years with pride. His success may be epitomized by a few salient accomplishments. During his two years' administration new members poured in to the number of 135.

## Consolidated of Baltimore Establishes Johns Hopkins Scholarships

The Consolidated Gas, Electric Light & Power Co. of Baltimore recognizes the need of a course which will train men in gas engineering. Consequently, it has united with members of the Southern Gas Association in establishing such a course at the Johns Hopkins University, Baltimore, Md. This course was opened in September, 1924. The university has made this course equal in rank with its electrical, mechanical and civil engineering courses. It will therefore be possible to secure ultimately from the university men technically trained in gas engineering, including such branches as the manufacture, distribution, utilization and service of gas just as it now is possible for the company to secure men technically trained in other engineering lines.

In order to establish this course in gas engineering on a permanent basis, and give to young men of ambition and ability an opportunity to prepare for desirable positions in an important and expanding business, the company is now offering two scholarships for this course, to be awarded in September, 1925, at the opening of the second year of the course.

These scholarships are open to residents of Baltimore and vicinity who can meet the university requirements for entrance.

The scholarships are worth $350 each per year, and will cover the payment of tuition, laboratory fees and other incidental university expenses up to the total amount specified.

The Gas By-Products Laboratory of the university is probably the only complete plant of its kind in America and is available for research work for students desiring to follow gas engineering. It includes a 400-pound retort, hydraulic main, condensers, tar extractor, scrubbers, purifier, tar and ammonia tanks and gas holder. Meters, calorimeters and complete equipment for the examination and analysis of fuel, gas and by-products are available in the laboratories of the department.

The Department of Gas Engineering at Johns Hopkins University makes an especial effort to maintain intimate contact with the various gas and fuel industries in and about Baltimore, which has long been a center for advanced developments in this field. Co-operative arrangements permit the use of the facilities of several of these industries for instruction and research. These contacts and the active co-operation of the Southern Gas Association, which initiated the establishment of this course and contributes financially to its support, insures to graduates consideration of their qualifications for filling important positions in the gas industry.

### Gas Companies Increase Capitalization

Albany, N. Y.—Northern New York Utilities, Inc., of Watertown, has filed a certificate in the office of the Secretary of State increasing its capital from fourteen to twenty million dollars.

Western New York Utilities Co., Inc., of Batavia, has increased the number of shares of its $100 par value preferred stock from 12,500 to 15,000 shares.

A group of eleven electric light and power companies serving territory on the east shore of the Hudson River from Westchester County to the Canadian line simultaneously filed certificates in the office of the Secretary of State changing the par value of their capital stock from a stated amount to non par value. The Public Service Commission advise a consolidation of these companies into one system is anticipated. The companies filing change of par value of stock include Amenia Electric Light & Power Co., Inc., Duchess County; Carmel Light & Power Co., Inc., Putnam County; Morgan & Hyman Electric Light & Power Co.; Lebanon Valley Electric Light & Power Co.; Salem Light, Heat & Power Co.,